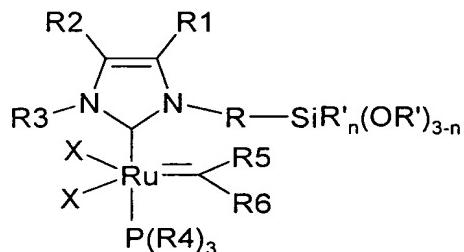


P A T E N T C L A I M S

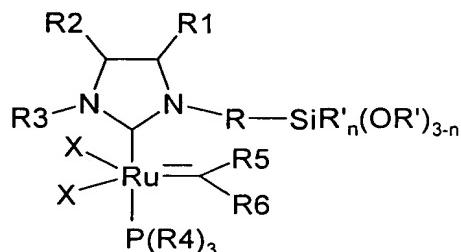
1. Compounds of the general formulae (I) and (II)

5



10

(I)



(II)

in which

15

R is A, Ar, A-Ar, A-Ar-A, Het, AHet or AHetA having a total of not more than 30 carbon atoms, where

20

A is a straight-chain, branched or saturated C₁-C₂₀-alkyl radical, cycloalkyl or cycloalkyl bonded via one or two alkyl group(s) having a total of 4 – 30 carbon atoms, where one CH₂ or CH group both in the alkyl radical and in the cycloalkyl radical may be replaced by N, NH, NA, O and/or S, and H atoms may be replaced by OA, NA₂ and/or PA₂,

25

Ar is mono- or polysubstituted or unsubstituted phenyl, naphthyl, anthryl or phenanthryl having a total of not more than 20 carbon atoms, where substituents may be A, Hal, OA, NA₂, PA₂, COOA, COA, CN, CONHA, NO₂, =NH or =O,

30

Het is a monocyclic or bicyclic, saturated or unsaturated or aromatic heterocyclic radical having from 1 to 4 N, O and/or S atoms, which may be unsubstituted or mono-, di- or trisubstituted by Hal and/or A, OA, COOA, COA, CN, CONHA, NA₂, PA₂, NO₂, =NH or =O, where

Hal is F, Cl, Br or I,

R', independently of the position in the molecule, is A or Ar having 1 – 12 carbon atoms,

35

R3 is A, Ar, AAr, AArA, Het, AHet or AHetA having 6 – 18 carbon atoms, in which the radical A which is not bonded to Ar or Het is an

alkyl or cycloalkyl which is unsubstituted or substituted by one or more groups Z, and Ar is an aromatic hydrocarbon which is unsubstituted or mono- or polysubstituted by a group Z, and Het is a saturated, unsaturated or aromatic heterocyclic radical, which may be mono- or polysubstituted by a group Z, and

5 R1 and R2, independently of one another, are H, Z, Hal or A, Ar, AAr, Het or AHet having 1 – 18 carbon atoms, in which the radical A which is not bonded to Ar or Het is alkyl or cycloalkyl which is unsubstituted or substituted by one or more groups Z, and Ar is an aromatic hydrocarbon which is unsubstituted or mono- or polysubstituted by a group Z,

10 R4 is A, Ar or AAr having 1 – 30 carbon atoms,

R5 and R6, independently of one another, are H, A or Ar, where H atoms in A or Ar may be substituted by alkenyl or alkynyl radicals, having not more than 30 carbon atoms, where

15 Hal is F, Cl, Br or I,

Z, independently of the position in R1, R2 and R3, are functional groups containing N, P, O or S atoms, or A or Ar, and

X are anionic ligands which are identical to or different from one another and which each form a ligand bond to Ru, and

20 n is 0, 1 or 2.

2. Compounds according to Claim 1 of the general formulae (I) and (II) in which

25 R is A, Ar, A-Ar, A-Ar-A, Het, AHet or AHetA having a total of not more than 20 carbon atoms,

R', independently of the position in the molecule, is a straight-chain, branched, saturated, mono- or polyunsaturated C₁-C₇-alkyl radical,

30 R3 is A, Ar, AAr, AArA, Het, AHet or AHetA having 1 – 18 carbon atoms, in which the radical A which is not bonded to Ar or Het is alkyl or cycloalkyl which is unsubstituted or substituted by one or more groups Z, and Ar is an aromatic hydrocarbon which is unsubstituted or mono- or polysubstituted by a group Z, and Het is a saturated, unsaturated or aromatic heterocyclic radical, which may be mono- or polysubstituted by a group Z, and

35

R1 and R2, independently of one another, are H, Hal or a straight-chain,
branched, saturated, mono- or polyunsaturated C₁-C₇-alkyl radical,
R4 is A or Ar having up to 10 carbon atoms,
R5 and R6, independently of one another, are H, alkyl, cycloalkyl, aryl,
5 alkenyl or alkynyl having up to 30 carbon atoms,
Hal is Cl or Br,
X is Br⁻, Cl⁻, I⁻ or F-, cyanide (CN⁻), thiocyanide (SCN⁻), alkoxide, aryl
oxide, alkyl, aryl or carboxyl,
Z is A
10 and
n is 0,
and A, Ar and Het are as defined in Claim 1.

3. Compounds according to Claim 1 of the general formulae (I) and (II)
15 in which
R is A, Ar, A-Ar or A-Ar-A having a total of not more than 20 carbon
atoms, where
A is a straight-chain or branched, saturated C₁-C₁₂-alkyl radical,
cycloalkyl having 3 – 10 carbon atoms or C₄-C₂₀-cycloalkyl which is
20 bonded via one or two alkyl group(s),
Ar is mono- or polysubstituted or unsubstituted phenyl, where substituents can adopt the meanings of A, and R has a total of not more
than 20 carbon atoms,
R', independently of the position in the molecule, is a straight-chain or
25 branched, saturated C₁-C₇-alkyl radical,
R3 is A with the meaning of a straight-chain, unbranched (linear),
branched, saturated, mono- or polyunsaturated or cyclic saturated,
mono- or polyunsaturated hydrocarbon radical having 1 – 18 carbon atoms or of an aromatic hydrocarbon radical having from 6 to
30 18 carbon atoms which is unsubstituted or substituted by Z = A,
R1 and R2, independently of one another, are H, Cl, Br, or a straight-chain, branched, saturated, mono- or polyunsaturated C₁-C₇-alkyl radical,
R4 is C₁-C₆-alkyl, C₅-C₈-cycloalkyl or C₆-C₁₀-aryl,
35 R5 and R6 are C₁-C₆-alkyl, C₅-C₈-cycloalkyl or C₆-C₁₀-aryl,
X is Cl or Br,

Z is A and
 n is 0,
 and A and Ar are as defined in Claim 1.

- 5 4. Compounds according to Claim 1 of the general formulae (I) and (II)
 in which
- R is C₁-C₁₂-alkylene, C₃-C₁₀-cycloalkylene, or C₄-C₂₀-cycloalkylene,
 C₆-C₁₄-arylene or C₇-C₂₀-alkylarylene which is bonded via one or
 two alkyl group(s),
- 10 R' is methyl, ethyl, propyl, i-propyl, butyl, i-butyl, sec-butyl, tert-butyl,
 pentyl, 1-, 2- or 3-methylbutyl (-C₅H₁₀-), 1,1-, 1,2- or 2,2-dimethyl-
 propyl (-C₅H₁₀-), 1-ethylpropyl (-C₅H₁₀-), hexyl (-C₆H₁₂-), 1-, 2-, 3- or
 4-methylpentyl (-C₆H₁₂-), 1,1-, 1,2-, 1,3-, 2,2-, 2,3- or 3,3-dimethyl-
 butyl (-C₆H₁₂-), 1- or 2-ethylbutyl (-C₆H₁₂-), 1-ethyl-1-methylpropyl
 15 (-C₆H₁₂-), 1-ethyl-2-methylpropyl (-C₆H₁₂-), 1,1,2- or 1,2,2-trimethyl-
 propyl (-C₆H₁₂-), heptyl, octyl, nonyl, decyl, undecyl, dodecyl, vinyl,
 propenyl, 1,2-propadienyl, butenyl, butadienyl, pentenyl, 1,2-, 1,4-
 or 1,3-pentadienyl, 2,3-dimethyl-2-butenyl, hexenyl, 1,5-hexadienyl,
 20 2-methyl-1,3-butadienyl, 2,3-dimethyl-1,3-butadienyl, isopentenyl,
 cyclopropenyl, cyclobutenyl, cyclopentenyl, cyclopentadienyl,
 methylcyclopentadienyl, ethynyl, 1,2-propynyl, 2-butynyl, 1,3-buta-
 diynyl, pentynyl or hexynyl,
- 25 R3 is phenyl, tolyl, 2,6-dimethylphenyl, mesityl, 2,6-diisopropylphenyl,
 2,4,6-triisopropylphenyl or cyclohexyl,
- R1 and R2 are SO₃H, F, Cl, hydroxyl, alkanoyl or cycloalkanoyl,
- R4 is methyl, ethyl, propyl, i-propyl, butyl, i-butyl, sec-butyl, tert-butyl,
 pentyl, 1-, 2- or 3-methylbutyl (-C₅H₁₀-), 1,1-, 1,2- or 2,2-dimethyl-
 propyl (-C₅H₁₀-), 1-ethylpropyl (-C₅H₁₀-), hexyl (-C₆H₁₂-), 1-, 2-, 3- or
 4-methylpentyl (-C₆H₁₂-), 1,1-, 1,2-, 1,3-, 2,2-, 2,3- or 3,3-dimethyl-
 butyl (-C₆H₁₂-), 1- or 2-ethylbutyl (-C₆H₁₂-), 1-ethyl-1-methylpropyl
 30 (-C₆H₁₂-), 1-ethyl-2-methylpropyl (-C₆H₁₂-), 1,1,2- or 1,2,2-trimethyl-
 propyl (-C₆H₁₂-), cyclopentyl, cyclohexyl, methylcyclopentyl, cyclo-
 heptyl, methylcyclohexyl, cyclooctyl, phenyl, o-, m- or p-tolyl, o-, m-
 or p-ethylphenyl, o-, m- or p-propylphenyl, o-, m- or p-isopropyl-
 35 phenyl, o-, m- or p-tert-butylphenyl or naphthyl,

R5 and R6 are methyl, ethyl, propyl, i-propyl, butyl, i-butyl, sec-butyl, tert-butyl, pentyl, 1-, 2- or 3-methylbutyl (-C₅H₁₀-), 1,1-, 1,2- or 2,2-dimethylpropyl (-C₅H₁₀-), 1-ethylpropyl (-C₅H₁₀-), hexyl (-C₆H₁₂-), 1-, 2-, 3- or 4-methylpentyl (-C₆H₁₂-), 1,1-, 1,2-, 1,3-, 2,2-, 2,3- or 3,3-dimethylbutyl (-C₆H₁₂-), 1- or 2-ethylbutyl (-C₆H₁₂-), 1-ethyl-1-methylpropyl (-C₆H₁₂-), 1-ethyl-2-methylpropyl (-C₆H₁₂-), 1,1,2- or 1,2,2-trimethylpropyl (-C₆H₁₂-), heptyl, octyl, nonyl, decyl, cyclopropenyl, cyclobutenyl, cyclopentenyl, cyclohexenyl, cyclopentadienyl and methylcyclopentadienyl, phenyl, o-, m- or p-tolyl, o-, m- or p-ethylphenyl, o-, m- or p-propylphenyl, o-, m- or p-isopropylphenyl, o-, m- or p-tert-butylphenyl, naphthyl, vinyl, propenyl, butenyl, pentenyl or hexenyl, ethynyl, propynyl, butynyl, pentynyl or hexynyl,

where X, Z and n can adopt the meanings given in Claim 1.

15

5. Compounds according to Claim 1 of the general formulae (I) and (II) in which

20

R is methylene, ethylene, propylene, butylene, -C₆H₄-, -C₆H₂Me₂-, -CH₂C₆H₄-, -CH₂C₆H₂Me₂-, -CH₂C₆H₄CH₂- or -CH₂C₆H₂Me₂CH₂-,

R' is methyl, ethyl, propyl, i-propyl, butyl, i-butyl, sec-butyl or tert-butyl,

R³ is phenyl, tolyl, 2,6-dimethylphenyl, mesityl, 2,6-diisopropylphenyl, 2,4,6-triisopropylphenyl or cyclohexyl,

25

R1 and R2, independently of one another, are H, methoxy, ethoxy, propionyl, butyryl, pentanoyl, hexanoyl, heptanoyl, octanoyl, nonanoyl, decanoyl, undecanoyl, dodecanoyl, tridecanoyl, tetradecanoyl, pentadecanoyl, hexadecanoyl, heptadecanoyl or octadecanoyl,

R4 is cyclohexyl, cyclopentyl, isopropyl or phenyl,

30

R5 and R6 are H, methyl, phenyl, vinyl, -C=CMe₂ or -C=CPH₂,

X is Cl or Br,

Z is A and

n is 0.

35

6. Compounds according to Claim 1 of the general formulae (I) and (II) in which

R is methyl, ethyl, propyl, butyl or 2,4-dimethyl,

R' is ethyl or methyl,
 R3 is methyl, i-propyl, t-butyl, mesityl, phenyl, cyclohexyl, 2,4-(di-i-propyl)phenyl or 2,4-dimethylphenyl,

R1 and R2 are H,

5 R4 is cyclohexyl or phenyl,

R5 and R6 are phenyl, cyclohexyl or -C=C(CH₃)₂,

X is Cl or Br, and

n is 0.

- 10 7. {1-[3-(Triethoxysilyl)ethyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(trimethoxysilyl)ethyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(triethoxysilyl)propyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 15 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(trimethoxysilyl)propyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(triethoxysilyl)butyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 20 {1-[3-(trimethoxysilyl)butyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(triethoxysilyl)ethyl]-3-(mesityl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(trimethoxysilyl)ethyl]-3-(mesityl)imidazol-2-ylidene}-
 25 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(triethoxysilyl)propyl]-3-(mesityl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(trimethoxysilyl)propyl]-3-(mesityl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 30 {1-[3-(triethoxysilyl)butyl]-3-(mesityl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(trimethoxysilyl)butyl]-3-(mesityl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[3-(triethoxysilyl)ethyl]-3-(phenyl)imidazol-2-ylidene}-
 35 [P(Cy)₃]Cl₂Ru=CHPh

- {1-[3-(trimethoxysilyl)ethyl]-3-(phenyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)propyl]-3-(phenyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
5 {1-[3-(trimethoxysilyl)propyl]-3-(phenyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)butyl]-3-(phenyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)butyl]-3-(phenyl)imidazol-2-ylidene}-
10 [P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)ethyl]-3-(cyclohexyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)ethyl]-3-(cyclohexyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
15 {1-[3-(triethoxysilyl)propyl]-3-(cyclohexyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)propyl]-3-(cyclohexyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)butyl]-3-(cyclohexyl)imidazol-2-ylidene}-
20 [P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)butyl]-3-(cyclohexyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)ethyl]-3-(t-butyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
25 {1-[3-(trimethoxysilyl)ethyl]-3-(t-butyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)propyl]-3-(t-butyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)propyl]-3-(t-butyl)imidazol-2-ylidene}-
30 [P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)butyl]-3-(t-butyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)butyl]-3-(t-butyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
35 {1-[3-(triethoxysilyl)ethyl]-3-(i-propyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh

- {1-[3-(trimethoxysilyl)ethyl]-3-(i-propyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)propyl]-3-(i-propyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
5 {1-[3-(trimethoxysilyl)propyl]-3-(i-propyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)butyl]-3-(i-propyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)butyl]-3-(i-propyl)imidazol-2-ylidene}-
10 [P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)ethyl]-3-(methyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)ethyl]-3-(methyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
15 {1-[3-(triethoxysilyl)propyl]-3-(methyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)propyl]-3-(methyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(triethoxysilyl)butyl]-3-(methyl)imidazol-2-ylidene}-
20 [P(Cy)₃]Cl₂Ru=CHPh
{1-[3-(trimethoxysilyl)butyl]-3-(methyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[4-(trimethoxysilyl)benzyl]-3-(mesityl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
25 {1-[4-(triethoxysilyl)benzyl]-3-(mesityl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[4-(trimethoxysilyl)benzyl]-3-(cyclohexyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[4-(triethoxysilyl)benzyl]-3-(cyclohexyl)imidazol-2-ylidene}-
30 [P(Cy)₃]Cl₂Ru=CHPh
{1-[4-(trimethoxysilyl)benzyl]-3-(methyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
{1-[4-(triethoxysilyl)benzyl]-3-(methyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh
35 {1-[4-(trimethoxysilyl)benzyl]-3-(phenyl)imidazol-2-ylidene}-
[P(Cy)₃]Cl₂Ru=CHPh

- {1-[4-(triethoxysilyl)benzyl]-3-(phenyl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(trimethoxysilyl)benzyl]-3-(i-propyl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 5 {1-[4-(triethoxysilyl)benzyl]-3-(i-propyl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(trimethoxysilyl)benzyl]-3-(t-butyl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(triethoxysilyl)benzyl]-3-(t-butyl)imidazol-2-ylidene}-
 10 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(trimethoxysilyl)benzyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(triethoxysilyl)benzyl]-3-[2,4-(di-i-propyl)phenyl]imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 15 {1-[4-(trimethoxysilyl)-2,4-(dimethyl)phenyl]-3-(mesityl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(triethoxysilyl)-2,4-(dimethyl)phenyl]-3-(mesityl)imidazol-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(trimethoxysilyl)-2,4-(dimethyl)phenyl]-3-(cyclohexyl)imidazol-2-
 20 ylidene}[P(Cy)₃]Cl₂Ru=CHPh
- {1-[4-(triethoxysilyl)-2,4-(dimethyl)phenyl]-3-(cyclohexyl)imidazol-2-
 ylidene}[P(Cy)₃]Cl₂Ru=CHPh
- as well as
- 25 {1-[3-(triethoxysilyl)ethyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)ethyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)propyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-ylidene}-
 30 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)propyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-
 ylidene}[P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)butyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)butyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-ylidene}-
 35 [P(Cy)₃]Cl₂Ru=CHPh

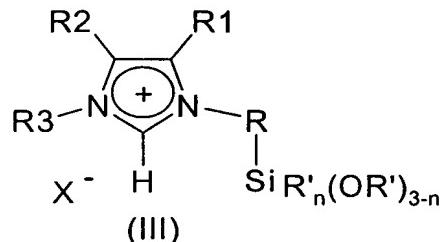
- {1-[3-(triethoxysilyl)ethyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)ethyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 5 {1-[3-(triethoxysilyl)propyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)propyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)butyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 10 {1-[3-(trimethoxysilyl)butyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)ethyl]-3-(phenyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 15 {1-[3-(trimethoxysilyl)ethyl]-3-(phenyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)propyl]-3-(phenyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)propyl]-3-(phenyl)imidazolin-2-ylidene}-
 20 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)butyl]-3-(phenyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)butyl]-3-(phenyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 25 {1-[3-(triethoxysilyl)ethyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)ethyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)propyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 30 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)propyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)butyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 35 {1-[3-(trimethoxysilyl)butyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh

- {1-[3-(triethoxysilyl)ethyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)ethyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 5 {1-[3-(triethoxysilyl)propyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)propyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)butyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 10 {1-[3-(trimethoxysilyl)butyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)ethyl]-3-(i-propyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 15 {1-[3-(trimethoxysilyl)ethyl]-3-(i-propyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)propyl]-3-(i-propyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)propyl]-3-(i-propyl)imidazolin-2-ylidene}-
 20 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)butyl]-3-(i-propyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)butyl]-3-(i-propyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 25 {1-[3-(triethoxysilyl)ethyl]-3-(methyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)ethyl]-3-(methyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)propyl]-3-(methyl)imidazolin-2-ylidene}-
 30 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(trimethoxysilyl)propyl]-3-(methyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- {1-[3-(triethoxysilyl)butyl]-3-(methyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 35 {1-[3-(trimethoxysilyl)butyl]-3-(methyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh

- {1-[4-(trimethoxysilyl)benzyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(triethoxysilyl)benzyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 5 {1-[4-(trimethoxysilyl)benzyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(triethoxysilyl)benzyl]-3-(cyclohexyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(trimethoxysilyl)benzyl]-3-(methyl)imidazolin-2-ylidene}-
 10 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(triethoxysilyl)benzyl]-3-(methyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(trimethoxysilyl)benzyl]-3-(phenyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 15 {1-[4-(triethoxysilyl)benzyl]-3-(phenyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(trimethoxysilyl)benzyl]-3-(i-propyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(triethoxysilyl)benzyl]-3-(i-propyl)imidazolin-2-ylidene}-
 20 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(trimethoxysilyl)benzyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(triethoxysilyl)benzyl]-3-(t-butyl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
- 25 {1-[4-(trimethoxysilyl)benzyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-
 ylidene}[P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(triethoxysilyl)benzyl]-3-[2,4-(di-i-propyl)phenyl]imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(trimethoxysilyl)-2,4-(dimethyl)phenyl]-3-(mesityl)imidazolin-2-
 30 ylidene}[P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(triethoxysilyl)-2,4-(dimethyl)phenyl]-3-(mesityl)imidazolin-2-ylidene}-
 [P(Cy)₃]Cl₂Ru=CHPh
 {1-[4-(trimethoxysilyl)-2,4-(dimethyl)phenyl]-3-(cyclohexyl)imidazolin-2-
 ylidene}[P(Cy)₃]Cl₂Ru=CHPh
- 35 {1-[4-(triethoxysilyl)-2,4-(dimethyl)phenyl]-3-(cyclohexyl)imidazolin-2-
 ylidene}[P(Cy)₃]Cl₂Ru=CHPh.

8. Process for the preparation of compounds of the general formulae (I) and (II), characterised in that an alkoxy-silyl-functionalised imidazolium salt of the general formula (III)

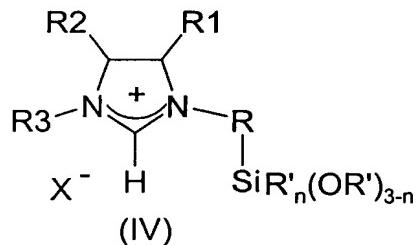
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or an alkoxy-silyl-functionalised 4,5-dihydroimidazolium salt of the general formula (IV)

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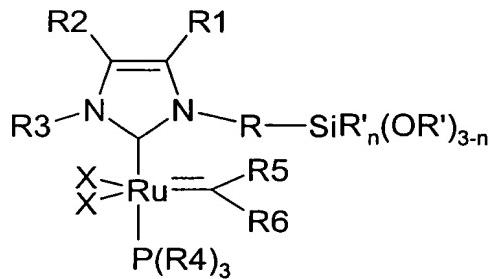
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in which R, R', R₁, R₂ and R₃ may adopt the meanings given in the preceding claims, and X⁻ can be an anion from the group consisting of F⁻, Cl⁻, Br⁻ and I⁻,

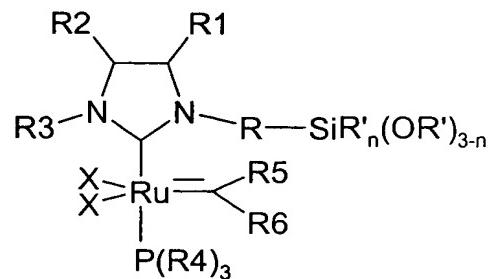
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is either converted directly into a compound of the general formula (I) or (II) respectively

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(I)



(II)

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by reacting the compounds of the general formula (III) or (IV) with a base

capable of deprotonation selected from the group consisting of the metal alkoxides (MOR), metal hydrides (MH), metal amides (MNH₂) and/or ammonia in the presence of a compound of the general formula (X)

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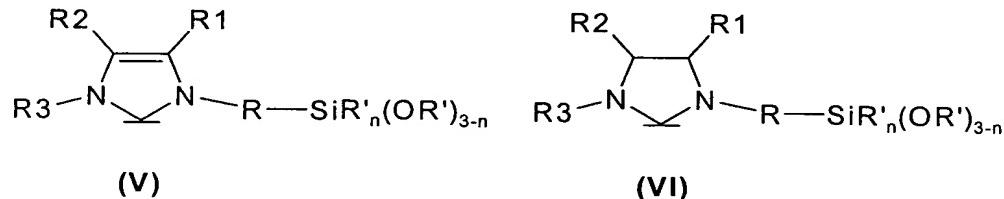


in which R4, R5, R6 and X are as in Claim 1,
in an anhydrous, inert, aprotic, organic solvent,
or

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in that the compounds of the general formula (III) or (IV), if necessary after prior purification, are reacted with a base selected from the group consisting of the metal alkoxides (MOR), metal hydrides (MH), metal amides (MNH₂) and/or ammonia in an anhydrous, inert, aprotic, organic solvent to give carbenes of the general formula (V) or (VI) respectively

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and are subsequently reacted with compounds of the general formula (X)



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in an anhydrous, inert, aprotic, organic solvent under a protective-gas atmosphere to give compounds of the general formula (I) or (II) respectively.

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9. Process according to Claim 8, characterised in that the compound of the general formula (III) or (IV), the base employed and the ruthenium compound of the general formula (X) are employed in a stoichiometric ratio in the range from 1:1:1 to 1:1.5:1.5, where the ratio of the base employed to the ruthenium compound is independent of one another.

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10. Process according to Claim 8, characterised in that KO^tbutoxide or KH is employed as base.

11. Process according to Claims 8 to 10, characterised in that the solvents used are hydrocarbons or ethers.
12. Process according to Claims 8 to 10, characterised in that, for the reaction of the compound of the general formula (III) or (IV) with a ruthenium compound of the general formula (X) in the presence of a base, a solvent selected from the group consisting of pentane, hexane, heptane, octane, decane, benzene, toluene and tetrahydrofuran or mixtures thereof is used.
13. Process according to Claims 8 – 12, characterised in that the reaction of the compound of the general formula (III) or (IV) with a ruthenium compound of the general formula (X) is carried out over the course of from 30 minutes to two days at a temperature in the range from -78 to +150°C, where the protective gas used is nitrogen or argon.
14. Process according to Claim 8, characterised in that the reaction of the compound of the general formula (V) or (VI) with a ruthenium compound of the general formula (X) is carried out in a solvent selected from the group consisting of pentane, hexane, heptane, octane, decane, benzene, toluene and tetrahydrofuran.
15. Process according to Claim 8, characterised in that the reaction of carbene of the general formula (V) or (VI) with a ruthenium compound of the general formula (X) is carried out in a stoichiometric ratio of between 1:1 and 1:1.5.
16. Process according to one or more of Claims 8, 14 and 15, characterised in that the reaction is carried out over the course of from 30 minutes to two days at a temperature in the range from -78 to +100°C.
17. Use of the compounds of the general formulae (I) and (II) as catalysts in organic and organometallic synthesis.

18. Use of the compounds of the general formulae (I) and (II) as starting materials for the preparation of immobilised catalysts for organic and organometallic syntheses.
- 5 19. Use of the compounds of the general formulae (I) and (II) as catalysts in C-C coupling reactions, hydrogenations, isomerisations, silylations and hydroformylations.
- 10 20. Use of the compounds of the general formulae (I) and (II) as catalysts in olefin metathesis reactions, such as cross metathesis (CM), ring closure metathesis (RCM), ring opening metathesis polymerisation (ROMP), acyclic diene metathesis polymerisation (ADMET) and ene-yne metathesis.

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